

### REMARKS

The Examiner is thanked for the performance of a thorough search.

#### STATUS OF CLAIMS

Claims 3, 4, 8-11, 13, 14, and 17-25 have been amended to correct typographical errors. Claim 26 has been added.

Claims 1-26 are currently pending in the application.

#### SUMMARY OF THE REJECTIONS/OBJECTIONS

Claims 1, 11, 21, and 22 have been rejected under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. Patent Number 6,304,912 issued to Oguchi et al. ("*Oguchi*"). Claims 7-10, 17-20, and 23-25 have been allowed. Claims 2-6 and 12-16 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The rejections are respectfully traversed.

#### RESPONSE TO REJECTIONS BASED ON THE PRIOR ART

Claims 1, 11, 21, and 22 have been rejected under 35 U.S.C. § 102(e) as allegedly anticipated by *Oguchi*. The rejection is respectfully traversed.

##### A. CLAIM 1

Claim 1 features:

“A method of determining a Layer 2 path between a source device and a destination device in a switched network, the method comprising the computer-implemented steps of:  
determining a Layer 3 path between the source device and the destination device, wherein the Layer 3 path comprises information identifying two or more Layer 3 devices;  
determining a subpath for **each contiguous pair of Layer 3 devices** in the Layer 3 path; and

**concatenating the subpaths** to result in creating and storing information representing the Layer 2 path.” (emphasis added).

Thus, Claim 1 features concatenating two or more subpaths based on the subpath for each contiguous pair of Layer 3 devices because at least two subpaths must be determined in the second step of “determining a subpath...” so that concatenation can occur in the third step of “concatenating the subpaths...” If there was only one subpath, there would be nothing to concatenate. Furthermore, each subpath corresponds to a contiguous pair of Layer 3 devices, such that concatenating the subpaths to create the Layer 2 path corresponds to the path among the Layer 3 devices.

In contrast, *Oguchi* discloses an approach for determining whether there is a Layer 2 path between two Layer 3 devices such that a “virtual connection” or “shortcut” can be established so as to avoid having to pass through Layer 3 devices. (See Col. 3, lines 19-28; Abstract.) Specifically, *Oguchi* merely discloses an approach for determining whether a Layer 2 path between the source host and the destination host exists that bypasses the Layer 3 devices such as the routers. (Col. 4, lines 48-63.) *Oguchi* fails to disclose, teach, suggest, or in any way render obvious determining multiple subpaths corresponding to **contiguous pairs** of Layer 3 devices and **concatenating** the subpaths as featured in Claim 1.

The Office Action states that *Oguchi* discloses “determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path (Fig 17, Ref SS2-4 used to determine a subpath between the adjacent layer 3 devices can be establish by layer 2 or not).” Also, the Office Action states that *Oguchi* discloses “concatenating the subpaths to result in creating and storing information representing the Layer 2 path (Fig 17, Ref L2-reachable, if the L2 reachable, then storing the layer 3 address with layer 2 address in the routing table, See Fig 28).”

However, the portions of *Oguchi* cited in the Office Action merely describe determining whether two communication apparatuses can communicate via a Layer 2 path only, thereby avoiding any Layer 3 devices. For example, *Oguchi* states in paragraph (24) of the “SUMMARY OF INVENTION” (which is referred to in discussing Fig. 17 in Col. 50, lines 3-8, stating that steps (a), (b), (c), and (d) of paragraph (24) correspond to steps SS1, SS2, SS3, and SS4 in Fig. 17): “[T]here is provided a process for determining layer-2 reachability between first and second communication apparatuses each connected to a layer-3

communication network comprised of at least one router and a plurality of subnetworks logically defined over at least one layer-2 connected communications network...to thereby determine whether or not the first and second communication apparatuses can communicate with each other by using a layer-2 communication path only.” (Col. 18, lines 59-65, and Col. 19, lines 17-20).

Step SS2 in Fig. 17 is “Identify first L2-connected network to which first interface belongs, where first router is connected with first communication apparatus through first interface” which discloses nothing about concatenating two or more subpaths based on the subpath that is determined for each contiguous pair of Layer 3 devices as featured in Claim 1.

Step SS3 is “Identify second L2-connected network to which second interface belongs, where second router is connected with second communication apparatus through second interface,” which discloses nothing about concatenating two or more subpaths based on the subpath that is determined for each contiguous pair of Layer 3 devices as featured in Claim 1.

Step SS4 is “First and second L2-connected networks are same?” According to the surrounding information for Step SS4 in Fig. 17, if the first and second L2-connected networks are the same, the first communication apparatus and the second communication apparatus are considered “L2-Reachable”, and if they are not the same, they are considered “L2-Unreachable,” which again discloses nothing about concatenating two or more subpaths based on the subpath that is determined for each contiguous pair of Layer 3 devices as featured in Claim 1.

Even taking all of steps SS2-SS4 together of Fig. 17, what *Oguchi* discloses is determining whether, for two communication apparatuses, a Layer 2 path exists that avoids Layer 3 devices. At best this might be characterized as determining whether a single Layer 2 path exists that avoids any Layer 3 devices. However, there is nothing in Fig. 17 or the related portions of *Oguchi* about having **two or more subpaths** between **contiguous pairs of Layer 3 devices**, little less **concatenating two or more subpaths** to create and store information representing a Layer 2 path, as featured in Claim 1.

In fact, there is nothing in *Oguchi* about creating and storing Layer 2 path information; rather in *Oguchi* information is just stored about interface network information (e.g., which network a particular interface is connected to, see Figs. 28A-28C) and there are examples of

message contents for determining reachability for a destination host (see Figs. 29, 30A, 30B, and 31A-31C).

In addition, the Office Action states with respect to the step of “concatenating...” of Claim 1, “if the L2 reachable, then storing the layer 3 address with layer 2 address in the routing table, See Fig 28.” However, Figs. 28A, 28B, and 28C “illustrate as example contents of the interface-network correspondence information storing unit 1002. FIG. 28A illustrates an example of contents of the interface-network correspondence information for the interfaces R1-A and R1-B of the router R1 in the configuration of FIG. 26,” and similarly Fig. 28B for interfaces R2-A and R2-B of router R2 and FIG. 28C for interfaces R3-A and R3-B of router R3. (Col. 59, lines 23-34). There is no Layer 2 path information in Figs. 28A-28C, nor is there any Layer 2 path information in the example message contents of Figs. 29, 30A, 30B, and 31A-31C.

Furthermore, *Oguchi* teaches away from the approach of Claim 1 because *Oguchi* focuses on determining whether a Layer 2 path exists that avoids Layer 3 devices while Claim 1 features determining a Layer 2 path by concatenating the subpaths between two or more pairs of contiguous Layer 3 devices based on the Layer 3 path. This can be seen clearly by comparing Fig. 32 and Fig. 37 of *Oguchi*. Fig. 32 illustrates an example in which H2 is “reachable” from H1 via the Layer 2 shortcut DP2, thereby avoiding any Layer 3 devices, such as routers R1’ - R5’. Fig. 37 illustrates an example in which H2 is “not reachable” from H1 via a Layer 2 shortcut because any communication must pass through both router R3” and R5”.

In contrast, the approach of Claim 1 applies to both the networks illustrated in Fig. 32 and Fig. 37. For example, in Fig. 37, assume that the Layer 3 path is H1, R3”, R5”, and H2. Then the first pair of contiguous Layer 3 devices would be H1 and R3”, for which a subpath is determined. Similarly, additional subpaths between R3” and R5” and also between R5” and H2 would be determined. The three resulting subpaths can then be concatenated to find the Layer 2 path between H1 and H2 based on the Layer 3 path of H1, R3”, R5”, and H2.

Similarly, a Layer 2 path can be determined in Fig. 32 for a given Layer 3 path that encompasses at least two pairs of contiguous Layer 3 devices. For example, if the Layer 3 path in Fig. 32 were H1, R2’, R3, R4’, and H2, then subpaths would be determined the following contiguous pairs of Layer 3 devices: H1 and R2’, R2’ and R3, R3 and R4’, and finally R4’ and H2. Note that since there would be at least two subpaths, the Layer 2 path

thus determined by the approach of Claim 1 would not correspond to the shortcut DP2 determined by the approach of *Oguchi* in Fig. 32.

While *Oguchi* discloses ascertaining whether a Layer 2 path exists between a source host and a destination host (e.g., determining whether the latter is “reachable” from the former via Layer 2 devices alone, thereby avoiding Layer 3 devices), *Oguchi* does not disclose, teach, suggest, or in any way render obvious “determining a subpath for **each contiguous pair of Layer 3 devices** in the Layer 3 path” and “concatenating the **subpaths** to result in creating and storing information representing the Layer 2 path” as feature in Claim 1.

Because *Oguchi* fails to disclose, teach, suggest, or in any way render obvious concatenating two or more subpaths based on the subpath for each contiguous pair of Layer 3 devices, the Applicant respectfully submits that, for at least the reasons stated above, Claim 1 is allowable over the art of record and is in condition for allowance.

#### B. CLAIMS 11, 21, 22, AND 26

Claims 11, 21, 22, and 26 contain features that are similar to those described above with respect to Claim 1, and in particular Claims 11, 21, 22, and 26 feature both “determining a subpath for **each contiguous pair of Layer 3 devices** in the Layer 3 path” and “concatenating the **subpaths** to result in creating and storing information representing the Layer 2 path” as in Claim 1. Therefore, based on at least the reasons stated above with respect to Claim 1, the Applicant respectfully submits that Claims 11, 21, 22, and 26 are allowable over the art of record and are in condition for allowance.

#### RESPONSE TO THE OBJECTIONS

Claims 2-6 and 12-16 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. As discussed above, the Applicant respectfully submits that the rejection of Claims 1 and 11 have been traversed, and therefore the objection to Claims 2-6 and 12-16 has been rendered moot.

## CONCLUSION

The Applicant believes that all issues raised in the Office Action have been addressed and that allowance of the pending claims is appropriate. Entry of the amendments and further examination on the merits are respectfully requested.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

For the reasons set forth above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, the issuance of a formal Notice of Allowance is believed next in order, and that action is most earnestly solicited.

To the extent necessary to make this reply timely filed, the Applicant petitions for an extension of time under 37 C.F.R. § 1.136.

If any applicable fee is missing or insufficient, throughout the pendency of this application, the Commissioner is hereby authorized to any applicable fees and to credit any overpayments to our Deposit Account No. 50-1302.

Respectfully submitted,

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### CERTIFICATE OF MAILING

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